

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 27 MAR 2006

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Applicant's or agent's file reference E1047.WO	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/GB2004/004590	International filing date (day/month/year) 29.10.2004	Priority date (day/month/year) 31.10.2003
International Patent Classification (IPC) or national classification and IPC INV. F24J2/04 H01L31/048		
Applicant SOLAR CENTURY HOLDINGS LIMITED et al		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 31.08.2005	Date of completion of this report 23.03.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Beltzung, F Telephone No. +31 70 340-2029 	

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/004590

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-13 as originally filed

Claims, Numbers

1-13 filed with telefax on 20.02.2006

Drawings, Sheets

1/11-11/11 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-13
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1 Reference is made to the following documents:

D1: DE 28 33 328 A
D2: DE 200 06 579 U
D3: DE 33 14 637 A
D6: EP 0 085 189 A

2 The following documents were not cited in the international search report:

D4: DE 196 03 540 A
D5: US 5 022 381 A

3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-13 does not involve an inventive step in the sense of Article 33(3) PCT.

3.1 Claim 1

The document D4 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (see column 3, line 3 - column 4, line 3 and figure 1; the references in parentheses applying to this document):

A set of tiles, incorporating at least one conventional roof tile (12), at least one solar thermal tile (12) [...]

wherein the at least one solar thermal tile (12) comprises a chassis on which is mounted a transparent portion (34) for permitting the entry of sunlight into a heating space (26) below the solar thermal tile (12), the chassis being formed separately from said transparent portion (34),

wherein the chassis comprises at least one protrusion (14, 16) on at least one edge and at least one aperture, said transparent portion (34) being located to cover the at least one aperture, said protrusion (14, 16) being adapted to form an overlapping

relationship with a second tile (12) when correctly mounted adjacent thereto [...].

The subject-matter of claim 1 therefore differs from this known set of tiles in that:

- (a) the set of tiles is incorporating at least one photovoltaic tile;
- (b) the at least one photovoltaic tile comprises a photovoltaic cell, a chassis and a photovoltaic laminate;
- (c) the chassis is substantially identical in external appearance to that of the at least one solar thermal tile;
- (d) said photovoltaic laminate is mounted in substantially the same position on the photovoltaic tile chassis as the transparent portion on the solar thermal tile chassis;
- (e) the at least one solar thermal tile has a tile width which is a multiple of the width of the at least one conventional roof tile.

However the same document D4 discloses, in another embodiment (see column 4, lines 4-44 and figures 2, 3), a photovoltaic tile (52) having:

- the features (b): the photovoltaic tile comprises a photovoltaic cell, a chassis and a photovoltaic laminate (58) (figure 3);
- the features (c): the chassis of this photovoltaic tile (52) is substantially identical in external appearance to that of the solar thermal tile (12) described in the same document: (compare figures 1 and 2) and
- the features (d): said photovoltaic laminate (58) is mounted in substantially the same position on the photovoltaic tile chassis as the transparent portion (34) on the solar thermal tile chassis described in the same document (compare figures 1 and 2).

As the chassis of the photovoltaic tile of the second embodiment (figure 2) has the same structure as the one of the solar thermal tile of the first embodiment (figure 1), and both tiles are intended to be interlocked with known tiles of the state of the art on existing roofs (see D4, column 2, lines 17-21), the skilled man **could** replace a solar thermal tile (12) in figure 1 by a photovoltaic tile (52) of figure 2.

However the skilled man **would** have combined both type of tiles, because the use of a set of tiles incorporating at least one solar thermal tile and at least one photovoltaic tile, for producing thermal and electrical energy, is already known from the prior art: see for instance D5 (see column 2, lines 28 - 35, column 5, lines 23 - 33 and figures 1, 9, 10). Therefore, it would be obvious to the person skilled in the art, namely when

the same result is to be achieved, to apply this feature (a) from D5 with corresponding effect to a set of tiles according to document D4.

Furthermore, it is generally known to the person skilled in the art to use a solar tile having a width which is a multiple of the width of a conventional tile for making the installation of the solar tile more easy, see document D6, page 2, line 10 - page 3, line 19, page 6, lines 5-35 and figures 1-3. It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply this feature (e) with corresponding effect to a set of tiles according to document D4.

Therefore, the solution proposed in claim 1 cannot be considered as involving an inventive step.

- 3.2 Dependent claims 2-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

The technical features of claims 2, 4, 5, 7, 8, 10 are also known from D4 (see column 3, line 3 - column 4, line 44 and figures 1-3).

In claims 3, 6, 9, 11-13 slight constructional changes in the set of tiles of claim 1 are defined which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen, for instance: for claim 3, see D5 (see column 2, lines 28-32); for claims 11, see D3 (see page 11, lines 24-32 and figure 3); for claim 12, 13, see D6 (see page 3, line 15, page 4, lines 3-7 and figure 1).

Therefore, claims 2-13 also lacks an inventive step.

- 4 The subject-matter of claims 1-13 is deemed to be industrially applicable (Article 33(4) PCT).

Re Item VII

Certain defects in the international application

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(SEPARATE SHEET)**

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- 5 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D4 is not mentioned in the description, nor is this document identified therein.
- 6 The features of the claims 2-10, 12, 13 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 7 Claims 2, 4, 6 erroneously refer to the "chasses" instead of the chassis.

27. 02. 2006

(51)

Claims

1. A set of tiles, incorporating at least one conventional roof tile (101), at least one solar thermal tile (1) and at least one photovoltaic tile (90),

5 wherein the at least one solar thermal tile comprises a chassis (6) on which is mounted a transparent portion (2) for permitting the entry of sunlight into a heating space below the at least one solar thermal tile, the chassis being formed separately from said transparent portion,

10 wherein the chassis comprises at least one protrusion (16,18) on at least one edge (12,14) and at least one aperture (30,31,32,33), said transparent portion being located to cover the at least one aperture, said protrusion being adapted to form an overlapping relationship with a second tile when correctly mounted adjacent thereto,

15 wherein the at least one solar thermal tile has a tile width which is a multiple of the width of the at least one conventional roof tile, and

wherein the at least one photovoltaic tile comprises a photovoltaic cell, a chassis (92) which is substantially identical in external appearance to that of the at least one solar thermal tile and a photovoltaic laminate (94), said photovoltaic laminate being mounted in substantially the same position on the photovoltaic
20 tile chassis as the transparent portion on the solar thermal tile chassis.

2. The set of tiles of claim 1, wherein the chassis comprise a non-transparent material.

25 3. The set of tiles of claim 2, wherein the non-transparent material is a plastic.

4. The set of tiles of claims 2 or 3, wherein the chassis are moulded components.

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5. The set of tiles of claim 2, wherein the non-transparent material is a metal.

6. The set of tiles of claim 5, wherein the chasses comprise folded sheet metal.

5 7. The set of tiles of any preceding claim, wherein the transparent portion has peripheral edges, and the solar thermal tile chassis is arranged to support the transparent portion at said peripheral edges.

8. The set of tiles of any preceding claim, wherein the transparent
10 portion comprises sheet material.

9. The set of tiles of any preceding claim, wherein the transparent portion is formed from polycarbonate material.

15 10. The set of tiles of any preceding claim, each chassis further incorporating a rear overlap surface, the rear overlap surface being formed to support a third tile placed above the at least one solar thermal tile and/or the at least one photovoltaic tile.

20 11. The set of tiles of any preceding claim, wherein the chassis of the photovoltaic tile further comprises at least one hole (91) to allow airflow.

12. The set of tiles of any preceding claim, wherein said multiple is
four.

25 13. A building comprising a surface, the surface comprising a set of tiles according to any preceding claim, the building further comprising a fluid heating system mounted in a heating space behind one or more solar thermal tiles.

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